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(54) LOCKING DEVICES

(71) We, HALLAM, SLEIGH & CHESTON LIMITED, a British Company, of Widney Works, Bagot Street, Birmingham B4 7BD, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to locking devices, for example, a locking device for locking a pull-out drawer or other pull-out unit carrying electrical or electronic equipment against accidentally moving outwards from, or back into, a cabinet or receptacle housing the pull-out unit when the latter is in a retracted position. The invention may, for example, be utilised in connection with pull-out drawers or other pull-out units of cabinets, carrying radar or other electronic equipment in a ship or aircraft, where the pull-out unit might, as a result of rolling or other movement of the ship or aircraft, be subject to forces tending to move it violently into or out of a cabinet or receptacle.

According to the invention, a locking device for locking a movable part or unit against a rectilinear movement relatively to a relatively-fixed part or unit comprises first and second members which, upon operation of spring-loaded control means against spring pressure into an unlocking condition, are movable together during a first stage of movement of said movable part or unit relatively to said relatively-fixed part or unit but which separate, with the first member becoming locked to the relatively-fixed part or unit, when the movement of said movable part or unit is continued beyond said first stage into a second stage of movement, said movement in this second stage causing said second member to move relatively to a part carried by said first member, manual release of said spring-loaded control means during the first stage of movement causing locking of said first

member to said relatively-fixed part or unit, and manual release of said spring-loaded control means during said second stage of movement causing locking of said second member to said part carried by said first member and thereby to said relatively-fixed part or unit.

Also, according to the invention, a locking device for locking a pull-out unit, for example a pull-out drawer, against outwards and return rectilinear movement relatively to a relatively-fixed part or unit comprises first and second rectilinearly-movable member carrying a stay or bar which is fixed to the said first rectilinearly-movable member against longitudinal movement relatively thereto and which, in use, extends in the direction of outwards and return movement of the pull-out unit, said first rectilinearly-movable member being lockable, against movement in the direction of outwards and return movement of the pull-out unit, to the relatively-fixed part or unit, and the second rectilinearly-movable member being, in use, movable along the said stay or bar and carrying locking means controlled by a manually-operable control rod or bar which is carried, in use, by the pull-out unit and is movable against spring pressure from a locking position to an unlocking position to cause movement of said locking means from interlocking engagement with said stay or bar to unlock said second rectilinearly-movable member from the stay or bar, the arrangement being such that, in use, when the pull-out unit is in a retracted position the control rod or bar is movable against spring pressure to cause release of said first rectilinearly-movable member from locking connection with said relatively-fixed part or unit to enable pulling-out of the pull-out unit to commence, said two rectilinearly-movable members moving connected together by latch means during a first stage of pulling-out of the pull-out

unit, until, at the end of said first stage, abutment of said latch means against striker means separates said rectilinearly-movable members from each other, and
 5 said control rod or member, or a part controlled thereby, upon the pull-out entering a second stage of movement, moves away from the first rectilinearly-movable member and causes the latter, and the stay
 10 or bar fixed thereto, to become lockingly connected to the relatively-fixed part, movement of said pull-out unit during said second stage causing the second rectilinearly-movable member to move along the stay
 15 or bar, release by the operator of the control rod or bar during said second stage of movement causing, for example by a cam action between sloping faces, movement of the
 20 aforesaid locking means to lock the said second slide member to the stay or bar, and return movement of the pull-out unit by the operator, with the control rod or bar moved by the operator against spring pressure, causing the said two rectilinearly-movable
 25 members to latch together and the first rectilinearly-movable member to become unlocked from the relatively-fixed part or unit so that the two rectilinearly-movable members can move together back to an
 30 initial position.

In one embodiment, the first rectilinearly-movable member is movable along a stay or bar which is, in use, relatively-fixed and which is parallel to the stay or bar fixed to
 35 the first rectilinearly-movable member, said first rectilinearly-movable member carrying locking means movable, by a control plunger controlled by the said control rod or bar, to interlock with the stay or bar
 40 along which the first rectilinearly-movable member moves, whereby movement of the control rod or bar against spring pressure when the pull-out unit is in a retracted position causes simultaneous release of the
 45 locking means carried by the rectilinearly-movable members from the respective stays or bars, release by the operator of the control rod or bar during the first stage of the pull-out movement causing, for example
 50 by cam action between sloping faces, simultaneous locking of the locking means carried by the rectilinearly-movable members with the said respective stays or bars.

In another embodiment, the first
 55 rectilinearly-movable member is slidable in a channel or slideway which is, in use, relatively fixed and carries a catch selectively engageable into locking apertures over which the said first rectilinearly-movable member moves during
 60 the first stage of movement of the pull-out unit, said catch being movable out of locking engagement with any of said apertures by movement of the control rod or bar
 65 against spring pressure to cause a part or

surface of or on the control rod or bar to cam against a part on or of said catch.

If desired there may be three or more releasably connected-together rectilinearly-movable members, comprising said first and
 70 second rectilinearly-movable members and at least one other rectilinearly-movable member, disposed one behind the other and releasably connected together by latches, with each of said three or more rectilinearly-movable members, except the rearmost
 75 member, being movable along a stay or bar fixed to the rectilinearly-movable member next in rear, the rearmost member being movable along a stay or bar secured to, or for securing to, the relatively-fixed part or unit, and the stays or bars being arranged in
 80 circumferentially-spaced parallel relationship around control means manually slidable against spring pressure to release locking means carried by the rectilinearly-movable members from interlocking engagement with
 85 respective ones of the stays or bars, whereby to unlock each rectilinearly-movable member from the respective stay or bar along which it moves, and the arrangement being such that during pulling-out of the pull-out unit from a retracted position to a fully-extended position, the
 90 rectilinearly-movable members separate from each other sequentially and (except the foremost member) lock sequentially with the respective ones of the stay or bars along which the rectilinearly-movable members
 95 are slidable, manual release of the control means rod or bar causing the foremost rectilinearly-movable member, and any other of the rectilinearly-movable members which are at the time unlocked, to lock with the
 100 respective stay or bar.

If desired there may be three or more releasably connected-together rectilinearly-movable members, comprising said first and
 110 second rectilinearly-movable members and at least one other rectilinearly-movable member, disposed in staggered relationship in the direction of outwards and return movement of the pull-out unit, and releasably connected together by latches, with
 115 each of said three or more rectilinearly-movable members, except the rearmost member, being movable along a respective stay or bar fixed to the rectilinearly-movable member next in rear, the rearmost member being slidable along a stay or bar secured to, or for securing to, the relatively-fixed part or unit, and the stays or bars being
 120 arranged, in spaced parallel relationship, in a row, and there being, parallel to said stays or bars, a plurality of control members which are movable rearwards in ganged-together relationship but which are separable from each other in a forwards direction, each of said control members being longitudinally movable rearwards, against spring
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pressure, to release locking means carried by a respective one of the rectilinearly-movable members from interlocking engagement with a respective one of the stays or bars, whereby to unlock said respective rectilinearly-movable member from said respective stay or bar along which it moves, and the arrangement being such that during the pulling-out of the pull-out unit from a retracted position to a fully-extended position, the control members disconnect sequentially in echelon order and the rectilinearly-movable members separate from each other sequentially and (except the foremost member) lock sequentially with the respective ones of the stays or bars along which the rectilinearly-movable members are movable, manual release of the control member respective to the foremost rectilinearly-movable member, and any other of the rectilinearly-movable members which are at the time unlocked, to lock with the respective stay or bar.

The or each said stay or bar may have thereon an external screw thread providing serrations interlockingly engageable with serrations which may be provided in the locking means carried by the rectilinearly-movable member which is movable along said stay or bar.

In the accompanying drawings, which show, by way of example, several embodiments constructed in accordance with the invention:

Figure 1 shows, applied to a pull-out drawer or other pull-out unit of a cabinet, a device for locking said pull-out unit against outwards and return sliding movement relatively to said cabinet, said device being shown, in longitudinal section, in a closed-up condition, with the pull-out unit in a fully-retracted closed position;

Figure 2 shows the locking device represented in Figure 1 but in an extended condition, with the pull-out unit in a fully-open position;

Figures 3 and 4 are cross-sections on the lines III-III, Figure 1, and IV-IV, Figure 1, respectively;

Figure 5 is a fragmentary elevation showing a latch of the arrangement shown in Figures 1 to 4;

Figure 6 is a longitudinal sectional view showing, in a full-retracted closed position, another embodiment;

Figures 7 and 8 are a cross-sections on the lines VII-VII, Figure 6 and VIII-VIII, Figure 6, respectively;

Figure 9 shows, in front end view, a further embodiment;

Figure 10 shows, also in front end view, another embodiment;

Figure 11 shows a still further embodiment;

Figure 12 is a cross-section on the line

XII-XII, Figure 11;

Figure 13 is a section on the line XIII-XIII, Figure 11; and

Figure 14 illustrates the manner in which control members in the arrangement shown in Figure 11 separate as a pull-out unit is pulled out.

Referring to Figures 1 to 5 of the drawings, a pull-out drawer or other pull-out unit 1 for carrying electrical or electronic equipment is supported by heavy-duty telescopic slides (not shown) connecting said unit 1 to a cabinet 2 installed in, for example, a ship or aircraft, said pull-out unit 1 being slidable outwards along said slides from a fully-retracted closed position in which it is housed completely in the cabinet 2, to a fully-open position in which it projects forward from said cabinet 2.

A device is provided for locking the unit 1 to the cabinet 2 against outwards and return sliding movement relatively to the latter. Said device comprises a pair of rear and front rectilinearly-movable members in the form of slide member 3 is slidable along a stay rod 5 rigidly secured at its rear end, at 6, to the cabinet 2 and extending longitudinally forwards in the direction of sliding of the unit 1, and the front slide member 4 is slidable along a stay rod 7 similar to, and parallel to, the stay rod 5 but carried by the slide member 3, the rear end of said rod 7 being rigidly secured to said slide member 3.

The stay rod 5 is provided with external serrations 8 in the form of screw threads, and the stay rod 7 is provided with serrations 9, likewise in the form of screw threads. The slide member 3 is provided with a bore 10 slidably receiving the serrated stay rod 5 and with a bore 11 slidably receiving a control plunger 12 biased by a strong spring 13 in a forwards direction. Housed within the slide member 3, between the stay rod 5 and the plunger 12, is locking means in the form of a locking element 14 which is movable transversely of the axis of the rod 5 and which has a face provided with serrations 15 interlockingly engageable with the serrations 8 on the rod 5, and an opposite face 16 which slopes relatively to the axis of the plunger 12 and is co-operable with a counter-part sloping face 17 on the plunger 12. The locking element 14 is biased by a light spring (similar to the spring 25 hereinafter referred to) in a direction away from the serrated stay rod 5. The other slide member 4 is provided with a bore 18 slidably receiving the stay rod 7 and with a bore 19 slidably receiving a control rod 20 which is slidably mounted in, and carried by, a front panel of the unit 1 and is disposed with its longitudinal axis between, and parallel to, the longitudinal axes of the stay rods 5, 7. The said control rod 20 is aligned

with the plunger 12 and has a rear end 20a chamfered as shown whereby the said end 20a can smoothly enter the bore 11, said end 20a being movable into said bore 11 to push back, against the spring 13, the plunger 12. Housed within the slide member 4, between the control rod 20 and the stay rod 7, is locking means in the form of a locking element 21 which is movable transversely of the axis of the rod 7 and which has a face provided with serrations 22 engagable with the serrations 9 on the rod 7, and an opposite face 23 which slopes relatively to the axis of the control rod 20, said face 23 being co-operable with a counter-part sloping face 24 on the control rod 20. This element 21 is biased in a direction away from the rod 7 by a light spring 25 (Figure 4). A strong spring 26 biases the control rod 20 in a forwards direction. The slide member 4 is rigidly secured to, so as to move with, the pull-out unit 1. The two slide members 3, 4 are connectible together, so as to be slidable as a single unit, by an S-shaped latch 27 (Figure 5) pivoted at 28 to the rear slide member 3 and having one end 27a lockingly engagable with a projection 29 on the front slide member 4 and an opposite end 27b engagable with a relatively-fixed stop in the form of a striker pin 30 on the stay rod 5 to cause tilting of the latch 27 to disengage the latch from the projection 29 and thereby to free the members 3, 4 for separation.

When the pull-out unit 1 is in its full-retracted closed position, the parts of the locking mechanism occupy the positions shown in Figure 1, in which the slide member 3 is adjacent the rear end of the stay 5, the two slide members 3, 4 are connected together by the latch 27, the plunger 12 is held by the strong bias spring 13 in a position in which the sloping faces 16, 17 engage with a cam action to hold the serrated locking element 14 firmly in interlocking engagement with the serrations 8 on the stay rod 5, the front end of the plunger 12 bears, under the pressure of the spring 13, against the end 20a of the control rod 20, and the control rod 20 is held by spring pressure in a position in which the sloping faces 23, 24 engage with a cam action to hold the serrated locking element 21 firmly in interlocking engagement with the serrations 9 on the rod 7. Thus, the pull-out unit 1 is securely locked to the cabinet 2 via the slide member 4, locking element 21, stay rod 7, slide member 3 (to which, as stated, the rod 7 is rigidly secured), locking element 14, and stay rod 5.

In order to free the pull-out unit 1 for pulling outwards from the cabinet to a fully-open position, the control rod 20 is pushed in, against the action of the springs 13, 26, by manual operation of a button 31

at the front end of the said rod 20, thereby causing the sloping faces 17, 24 to move relatively to the respective counter-part sloping faces 16, 23, whereby the respective locking elements 14, 21 disengage from the respective stay rods 5, 7 under the action of the respective aforesaid light springs biasing said elements. The pull-out unit is now free to move forwards, provided that the operator keeps the control rod 20 pushed in, and during a first stage of the pulling-out of the unit 1, the latched-together slide member 3, 4 slide forwards together as a single unit sliding along the stay rod 5. When the latch 27 strikes the striker pin 30, that is when the rear slide member 3 reaches the front end of the stay rod 5, the latch is thereby turned so that the front slide member 4 is released from the rear slide member 3, the unit 1 now entering a second stage of pulling-out movement. As this second stage of movement commences, the end 20a of the control rod 20 leaves the front end of the plunger 12 whereby the latter is moved forwards by the spring 13 to cause the locking element 14 to interlock with the stay rod 5, thereby securely locking the slide member 3, and the stay rod 7 carried thereby, to the cabinet 2 via the stay rod 5. Upon continuing this second stage of movement of the unit 1, the front slide member 4 and the control rod 20 continue to move forwards relatively to the stay rod 7 until the desired open position of the unit 1 is reached, and upon the control rod 20 then being released by the operator, the spring 26 moves the rod 20 forwards to cause the locking element 21 to interlock with the stay rod 7 and thereby securely locking the unit 1, via the slide member 4, the stay rod 7, the slide member 3, and the stay rod 5, to the cabinet 2.

In order to return the pulled-out unit 1 to its closed position, the operator pushes in the control rod 20 to release the locking element 21 from the stay rod 7, thereby freeing the unit 1 for movement towards the cabinet 2. When the pin 29 on the slide member 4 reaches a rounded front edge of the end 27a of the S-shaped latch 27 it lifts the latch 27 so that the members 3, 4 again become latched together, the end 20a of the control rod 20 at the same time engaging and pushing back the plunger 12 to cause the locking element 14 to disengage from the stay rod 5 so that both slide members 3, 4, can move back, as one unit, relatively to the stay rod 5 until the unit 1 has been pushed fully home. On releasing the control rod 20, the sloping faces 17, 24 engage the respective sloping faces 16, 23 with a cam action to hold the respective locking elements 14, 21 in interlocking engagement with the respective rods 5, 7, and the unit 1 again becomes securely locked to the

cabinet 2.

If the operator should accidentally let go of the knob 31 whilst pushing in or pulling out the unit, for example, if, in the case where the cabinet is installed in a ship or aircraft, he should be thrown off his balance by a sudden violent roll or lurch of the ship or aircraft, the resultant release of the control rod 20 immediately causes locking of the slide member 4 to the stay rod 7 and (if the slide member 3 is not at the time separated from the slide member 4 and thereby already locked) locking of the slide member 3 to the stay rod 5. The pull-out unit 1 is thereby immediately locked to the cabinet 2, thereby avoiding a possibly violent unchecked sliding movement of the unit 1 into or outwards from the cabinet, which movement could cause damage to equipment carried by the unit 1.

In the modification shown in Figures 6 to 8, a device for locking a pull-out unit 1 to a cabinet 2 against sliding outwards and return movement relatively to the latter comprises rear and front slide members 32, 33. The front slide member 33 is rigidly secured to the unit 1 and is slidable along a serrated stay rod 34 and receives a control rod 35 which is slidably mounted in the unit 1 and can be manually pushed in against a spring 36 to cause a spring-biased serrated locking element 37 in the slide member 33 to disengage from the serrated stay rod 34 to unlock the slide member 33 from the stay rod 34, similarly to the manner in which, in the arrangement shown in Figures 1 to 5, pushing in of the control rod 20 causes the slide member 4 to be unlocked from the stay rod 7. In the arrangement shown in Figures 6 to 8, however, there is no rear stay rod corresponding to the hereinbefore described stay rod 5, and instead the rear slide member 32 is slidable along a channel 38 fixed to the cabinet 2. This rear slide member 32 has the stay rod 34 rigidly secured thereto, and the said slide member 32 carries a catch 39 which is mounted for movement, in a plane transverse to the direction of sliding of the member 32, about a pivotal axis 40 and is selectively engageable with any one of a plurality of longitudinally-spaced notches, such as 41, in the channel 38. The rear part of the control rod 35 has a rear end 35a engageable with a slot 42 in the catch 39 to cause, by a cam action, lifting of the catch 39, against spring action, out of engagement with a notch in the notched channel 38. The two slide members 32, 33, are releasably connected together by a latch (not shown) which is similar to the latch 27 and which is, when the unit 1 is being pulled out, engageable with a striker pin (not shown) to allow said slide members 32, 33, to separate.

When it is desired to pull out the unit 1,

the control rod 35 is manually depressed to cause the locking element 37 and the catch 39 respectively to disengage from the serrated stay rod 34 and a notch in the notched channel 38, thereby allowing (provided that the rod 35 is kept depressed) the slide members 32, 33, to slide together, as the unit 1 is pulled out, until the latch strikes the striker pin and is thereby lifted, further pull-out movement of the unit 1 causing the slide members 32, 33 to separate, the rear end 35a of the control rod to move forwards from the catch 39 so that the latter is now free to engage, under torsion spring bias, with a notch in the channel 38 to lock the rear slide member 32 to said channel, and the front slide member 33 to slide along the stay rod 34. Release of the control rod 35 causes the latter to be moved by the spring 36 to cause the serrated element 37 to lock with the stay rod 34.

In the embodiment shown in Figure 9, a device for locking a pull-out unit to a cabinet against outwards and return sliding movement relatively to the latter comprises three slide members 43, 44, 45 disposed one behind the other and releasably connected together by latches each operable similarly to the latch 27, the rear slide member 43 being slidable along a serrated stay rod 46 fixed to the cabinet, the intermediate slide member 44 being slidable along a serrated stay rod 47 fixed to the rear slide member 43, and the front slide member 45 being fixed to the pull-out unit and being slidable along a serrated stay rod 48 fixed to the intermediate slide member 44. A spring-loaded control rod 49, slidably mounted in the pull-out unit, controls a serrated locking element (not shown) which is in the slide member 45 and is lockingly engageable with the serrated stay rod 48. Said rod 49 is aligned with, and engageable with, the front end of a spring-loaded control plunger (not shown) which constitutes a part controlled by the control rod 49 and which is mounted in the slide member 44 and controls a serrated locking element which is also in the slide member 44 and is lockingly engageable with the serrated stay rod 47. The rear end of the said plunger is aligned with, and engageable with, the front end of a second spring-loaded control plunger (not shown) mounted in the rear slide member 43 and controlling a serrated locking element which is in said rear slide member 43 and is lockingly engageable with the rear serrated stay rod 46. The stay rods 46, 47, 48 are arranged in circumferentially-spaced relationship around the axis of the control rod 49 and control plungers. The arrangement is such that, during the pulling-out of the unit, with the control rod 49 in a pushed-in position, to a fully-extended position, the rear slide member 43 becomes detached from the

slide members 44, 45 and is locked with the rear stay rod 46, as the control plunger in the slide member 44 moves away from the said slide member 43, and subsequently the intermediate slide member 44 becomes detached from the front slide member 45 and is locked with the intermediate stay rod 47 as the control rod 49 moves away from the slide member 44. Release of the control rod 49 causes the front slide member 45 to become locked with the stay rod 48 and (if not already locked) the slide members 43, 44 to become locked with the respective stay rods 46, 47. On pushing in the pull-out unit, with the control rod 49 pushed-in, the members 43, 44, 45 again latch together.

Figure 10 shows an arrangement similar to that shown in Figure 9, except that instead of three slide members slidable on three respective stay rods, there are four slide members 50, 51, 52, 53 respectively slidable on four stay rods 54, 55, 56, 57 spaced around the axis of a control rod 58, there being in this case three control plungers, one in each of the rear three slide members 50, 51, 52.

In the embodiment shown in Figures 11 to 14, a device for locking a pull-out unit to a cabinet against outwards and return sliding movement relatively to the latter comprises a plurality of slide members 59, 60, 61, 62 disposed in staggered relationship in the direction of sliding of the unit and releasably connected together by latches each operable similarly to the latch 27, with the rearmost slide member 59 slidable along a serrated stay rod 63 fixed to the cabinet, and with each of the other slide members 60, 61, 62, slidable along a respective serrated stay rod 64, 65, or 66, fixed to the slide member next in rear. The stay rods are spaced parallel to each other, in a row, and there are, parallel to said stay rods, a plurality of control members 67, 68, 69, 70 which are movable rearwards in ganged-together relationship but which are separable from each other in a forwards direction, each of said control members being longitudinally-movable, against spring pressure, to move a serrated locking element in a respective one of the slide members, 59, 60, 61 or 62, to unlock said respective slide member from the stay rod on which it slides, the arrangement being such that during the pulling-out of the pull-out unit, from a fully-retracted position to a fully-open position, the control members 67 to 70 disconnect sequentially in echelon order, as illustrated in Figure 14, and the slide members, except the foremost slide member 62, during said movement, separate from each other sequentially and lock sequentially with the respective stay rods along which they are slidable, manual release of the ganged-together control rod sections causing the

foremost slide member 62, and any other of the slide members which are at the time unlocked, to lock with the respective stay or bar.

A locking device constructed in accordance with the invention may also be utilised, in suitable cases, for locking a part or unit other than a pull-out unit carried by a cabinet for installation in a ship or aircraft.

WHAT WE CLAIM IS:—

1. A locking device for locking a movable part or unit against a rectilinear movement relatively to a relatively-fixed part or unit, said device comprising first and second members which, upon operation of spring-loaded control means against spring pressure into an unlocking condition, are movable together during a first stage of movement of said movable part or unit relatively to said relatively-fixed part or unit but which separate, with the first member becoming locked to the relatively-fixed part or unit, when the movement of said movable part or unit is continued beyond said first stage into a second stage of movement, said movement in this second stage causing said second member to move relatively to a part carried by said first member, manual release of said spring-loaded control means during the first stage of movement causing locking of said first member to said relatively-fixed part or unit, and manual release of said spring-loaded control means during said second stage of movement causing locking of said second member to said part carried by said first member and thereby to said relatively-fixed part or unit.

2. A locking device for locking a pull-out unit against outwards and return rectilinear movement relatively to a relatively-fixed part or unit, said device comprising first and second rectilinearly-movable members, the first rectilinearly-movable member carrying a stay or bar which is fixed to the said first rectilinearly-movable member against longitudinal movement relatively thereto and which, in use, extends in the direction of outwards and return movement of the pull-out unit, said first rectilinearly-movable member being lockable, against movement in the direction of outwards and return movement of the pull-out unit, to the relatively-fixed part or unit, and the second rectilinearly-movable member being, in use, movable along the said stay or bar and carrying locking means controlled by a manually-operable control rod or bar which is carried, in use, by the pull-out unit and is movable against spring pressure from a locking position to an unlocking position to cause movement of said locking means from interlocking engagement with said stay or bar to unlock said second rectilinearly-movable

member from the stay or bar, the arrangement being such that, in use, when the pull-out unit is in a retracted position the control rod or bar is movable against spring pressure to cause release of said first rectilinearly-movable member from locking connection with said relatively-fixed part or unit to enable pulling-out of the pull-out unit to commence, said two rectilinearly-movable members moving connected together by latch means during a first stage of pulling-out of the pull-out unit, until, at the end of said first stage, abutment of said latch means against striker means separates said rectilinearly-movable members from each other, and said control rod or bar, or a part controlled thereby, upon the pull-out unit entering a second stage of movement, moves away from the first rectilinearly-movable member and causes the latter, and the stay or bar fixed thereto, to become lockingly connected to the relatively-fixed part, movement of said pull-out unit during said second stage causing the second rectilinearly-movable member to move along the stay or bar, release by the operator of the control rod or bar during said second stage of movement causing movement of the aforesaid locking means to lock the said second slide member to the stay or bar, and return movement of the pull-out unit by the operator, with the control rod or bar moved by the operator against spring pressure, causing the said two rectilinearly-movable members to latch together and the first rectilinearly-movable member to become unlocked from the relatively-fixed part or unit so that the two rectilinearly-movable members can move together back to an initial position.

3. A locking device, as claimed in claim 2, wherein the first rectilinearly-movable member is movable along a stay or bar which is, in use, relatively-fixed and which is parallel to the stay or bar fixed to the first rectilinearly-movable member, said first rectilinearly-movable member carrying locking means movable, by a control plunger controlled by the control rod or bar, to interlock with the stay or bar along which the first rectilinearly-movable member moves, whereby movement of the control rod or bar against spring pressure when the pull-out unit is in a retracted position causes simultaneous release of the locking means carried by the rectilinearly-movable members from the respective stays or bars, release by the operator of the control rod or bar during the first stage of the pull-out movement causing simultaneous locking of the locking means carried by the rectilinearly-movable members with the said respective stays or bars.

4. A locking device, as claimed in claim 2 or 3, wherein the control rod or bar has a sloping face which, when the said rod or

bar is released from its locking position, co-acts with a sloping face of the locking means carried by the second rectilinearly-movable member to cause, by a cam action, movement of the said locking means into interlocking engagement with the stay or bar fixed to the first rectilinearly-movable member.

5. A locking device, as claimed in claim 4, insofar as it is dependent upon claim 3, wherein the control plunger has a sloping face which, when the control rod or bar is released during the first stage of the pull-out movement, co-acts with a sloping face of the locking means carried by the first rectilinearly-movable member to cause, by a cam action, movement of said locking means carried by the first rectilinearly-movable member into interlocking engagement with the respective stay or bar.

6. A locking device, as claimed in claim 2, wherein the first rectilinearly-movable member is slidable in a channel or slideway which is, in use, relatively fixed and said first rectilinearly-movable member carries a catch selectively engagable into locking apertures over which the said first rectilinearly-movable member moves during the first stage of movement of the pull-out unit, said catch being movable out of locking engagement with any of said apertures by movement of the control rod or bar against spring pressure to cause a part or surface of or on the control rod or bar to cam against a part on or of said catch.

7. A locking device, as claimed in claim 3, wherein there are three or more releasably connected-together rectilinearly-movable members, comprising said first and second rectilinearly-movable members and at least one other rectilinearly-movable member, disposed one behind the other and releasably connected together by latches, with each of said three or more rectilinearly-movable members, except the rearmost member, being movable along a stay or bar fixed to the rectilinearly-movable member next in rear, the rearmost member being movable along a stay or bar secured to, or for securing to, the relatively-fixed part or unit, and the stays or bars being arranged in circumferentially-spaced parallel relationship around control means manually slidable against spring pressure to release locking means carried by the rectilinearly-movable members from interlocking engagement with respective ones of the stays or bars, whereby to unlock each rectilinearly-movable member from the respective stay or bar along which it moves, and the arrangement being such that during pulling-out of the pull-out unit from a retracted position to a fully-extended position, the rectilinearly-movable members separate from each other sequentially and (except the foremost member) lock sequentially with the

respective ones of the stays or bars along which the rectilinearly-movable members are slidable, manual release of the control means causing the foremost rectilinearly-movable member, and any other of the rectilinearly-movable members which are at the time unlocked, to lock with the respective stay or bar.

8. A locking device, as claimed in claim 3, wherein there are three or more releasably connected-together rectilinearly-movable members, comprising said first and second rectilinearly-movable members and at least one other rectilinearly-movable member, disposed in staggered relationship in the direction of sliding of the pull-out unit, and releasably connected together by latches, with each of said three or more rectilinearly-movable members, except the rearmost member, being movable along a respective stay or bar fixed to the rectilinearly-movable member next in rear, the rearmost member being slidable along a stay or bar secured to, or for securing to, the relatively-fixed part or unit, and the stays or bar being arranged, in spaced parallel relationship, in a row, and there being, parallel to said stays or bars, a plurality of control members which are movable rearwards in ganged-together relationship but which are separable from each other in a forwards direction, each of said control members being longitudinally movable rearwards, against spring pressure, to release locking means carried by a respective one of the rectilinearly-movable members from interlocking engagement with a respective one of the stays or bars, whereby to unlock said respective rectilinearly-movable member from said respective stay or bar along which

it moves, and the arrangement being such that during the pulling-out of the pull-out unit from a retracted position to a fully-extended position, the control members disconnect sequentially in echelon order and the rectilinearly-movable members separate from each other sequentially and (except the foremost member) lock sequentially with the respective ones of the stays or bars along which the rectilinearly-movable members are movable, manual release of the control member respective to the foremost rectilinearly-movable member causing the foremost rectilinearly-movable member, and any other of the rectilinearly-movable members which are at the time unlocked, to lock with the respective stay or bar.

9. A locking device as claimed in any one of claims 2 to 8, wherein the or each said stay or bar has thereon an external screw thread providing serrations interlockingly engageable with serrations in the locking means carried by the rectilinearly-movable member which is movable along said stay or bar.

10. A locking device for locking a pull-out unit, substantially as herein described with reference to Figures 1 to 5, or Figures 6 to 8, or Figure 9, or Figure 10, or Figures 11 to 14, of the accompanying drawings.

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FIG. 1.

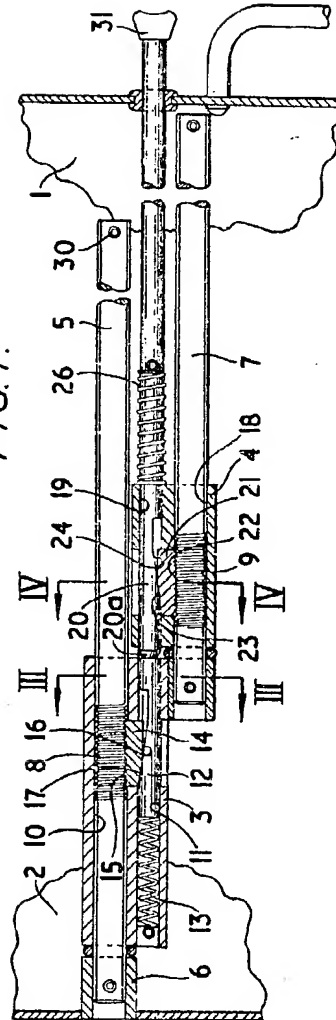


FIG. 2.

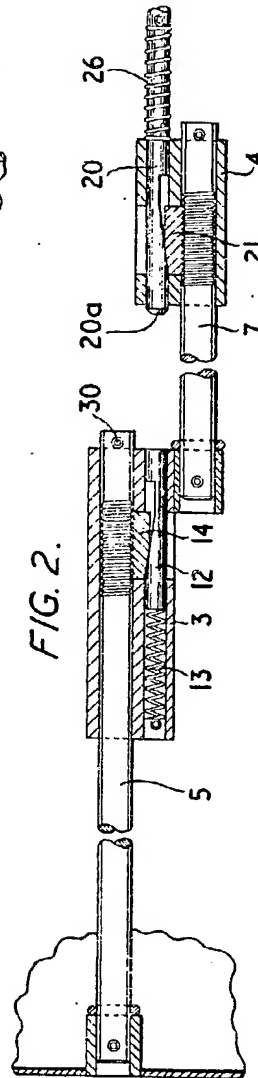


FIG. 3.

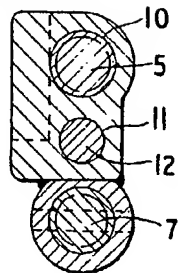


FIG. 4.

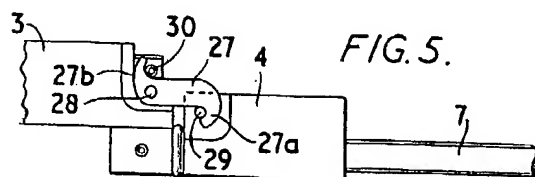
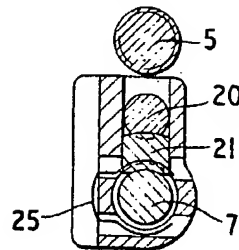


FIG. 5.

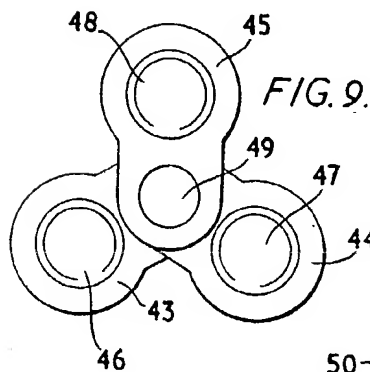


FIG. 9.

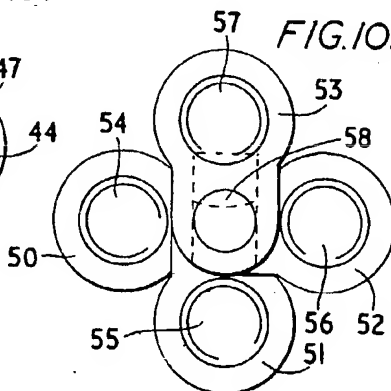
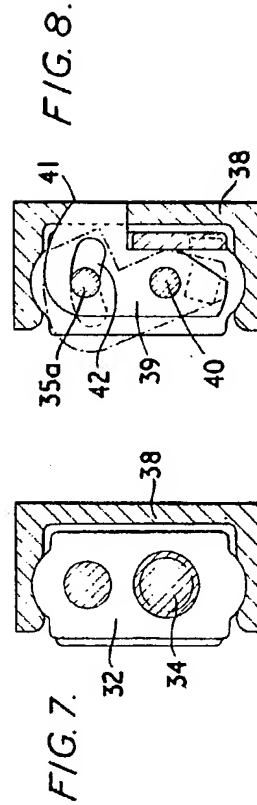
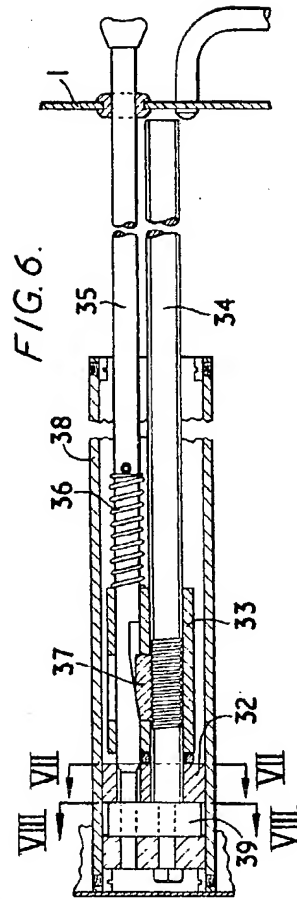


FIG. 10.



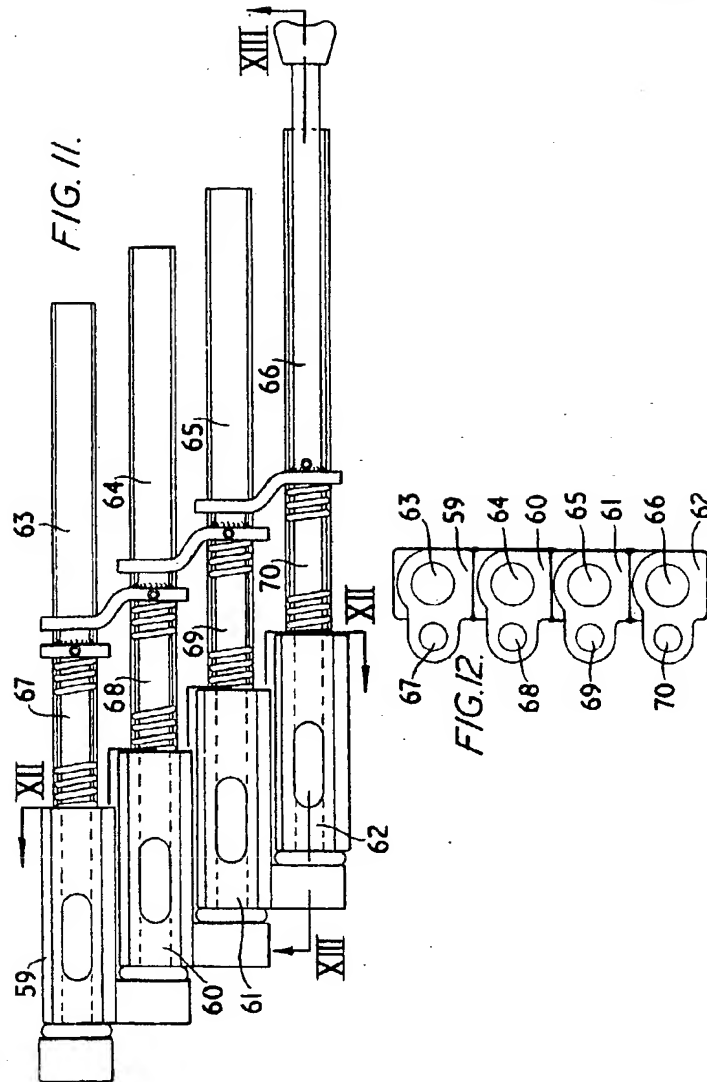
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